Altivar 21W

Guide simplifié
Simplified manual
Kurzanleitung
Guía simplificada
Guida semplificata
简明手册

A conserver pour usage ultérieur
Retain for future use
Als Referenz griffbereit aufbewahren
Consérvese para uso futuro
妥善保存，以备日后使用。

Variateurs de vitesse
pour moteurs asynchrones
Variable speed drives
for asynchronous motors
Frequenzumrichter
für Asynchronmotoren
Variadores de velocidad
para motores asíncronos
异步电机变频器

0,75 kW (1 HP) ... 75 kW (100 HP) / 380 - 480 V

UL Type 12/IP54.
UL 12 型 /IP54。

a brand of Schneider Electric

Telemecanique

Contents

Important information 41
Before you begin 42
Steps for setting up the drive 43
Preliminary recommendations 44
Drive references 45
Dimensions 47
Installation 48
Opening the drive 49
Position of the capacitor charging LED 50
Wiring recommendations 51
Power terminals 52
Control terminals 54
Connection diagrams 56
Operation on an IT system 58
Layout of jumpers and disconnects for filters 59
Electromagnetic compatibility, wiring 63
Integrated display terminal 68
Programming 69
Adjustment mode 71
Monitoring mode 74

Important information

WARNING

Please read these instructions carefully and examine the device in order to familiarize yourself with it prior to installation, operation or maintenance. The specific messages below can appear in the documentation or on the device. They warn of potential dangers or draw your attention to information that can clarify or simplify a procedure.

This symbol on a hazard or warning label indicates a potential risk of electrocution, which can result in bodily harm in the event of non-compliance with the accompanying instructions.

This symbol indicates a safety hazard. It warns of the potential risk of physical injury.
You must observe all safety instructions accompanied by this symbol in order to avoid situations that can result in serious physical injury or even death.

⚠ DANGER

DANGER indicates a dangerous situation that **will** result in death, serious physical injury or equipment damage.

⚠ WARNING

WARNING indicates a dangerous situation that **can** result in death, serious physical injury or equipment damage.

⚠ CAUTION

CAUTION indicates a potentially dangerous situation that **might possibly** result in bodily harm or equipment damage.

IMPORTANT NOTE

Electrical equipment must only be serviced by qualified personnel. Schneider Electric will not accept any responsibility for consequences associated with the use of this document. This document must not be used as a training guide for beginners.
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Before you begin

Read and understand these instructions before performing any procedure on this drive.

⚠ DANGER

HAZARDOUS VOLTAGE

- Read and understand this manual before installing or operating the ATV21 drive. Installation, adjustment, repair, and maintenance must be performed by qualified personnel.
- The user is responsible for compliance with all international and national electrical standards in force concerning protective grounding of all equipment.
- Many parts of this variable speed drive, including the printed circuit boards, operate at the line voltage. DO NOT TOUCH.
  Use only electrically insulated tools.
- DO NOT touch unshielded components or terminal strip screw connections with voltage present.
- DO NOT short across terminals PA and PC or across the DC bus capacitors.
- Install and close all the covers before applying power or starting and stopping the drive.
- Before servicing the variable speed drive
  - Disconnect all power.
  - Place a "DO NOT TURN ON" label on the variable speed drive disconnect.
  - Lock the disconnect in the open position.
- Disconnect all power including external control power that may be present before servicing the drive. Wait for the charging LED to go off. WAIT 10 MINUTES to allow the DC bus capacitors to discharge. Then follow the DC bus voltage measurement procedure on page 50 to verify that the DC voltage is less than 45 V. The drive LEDs are not accurate indicators of the absence of DC bus voltage.

Failure to follow these instructions will result in death, serious physical injury or equipment damage.

⚠ CAUTION

IMPROPER DRIVE OPERATION

- If the drive is not switched on for a long period, the performance of its electrolytic capacitors will be reduced.
- If it is stopped for a prolonged period, turn the drive on every two years for at least 5 hours to restore the performance of the capacitors, then check its operation. It is recommended that the drive is not connected directly to the line voltage. The voltage should be increased gradually using an adjustable AC source.

Failure to follow this instruction can result in physical injury and/or equipment damage.

Steps for setting up the drive

■ 1 Take delivery of the drive

- Check that the catalog number printed on the label is the same as that on the purchase order.
- Remove the Altivar from its packaging and check that it has not been damaged in transit.

■ 2 Check the line voltage.

- Check that the line voltage is compatible with the voltage range of the drive.

■ 3 Mount the drive (page 48).

- Mount the drive in accordance with the instructions in this document.
- Install any internal and external options.

■ 4 Wire the drive (page 51).

- Connect the motor, ensuring that its connections correspond to the voltage.
- Connect the line supply, after making sure that it is turned off.
- Connect the control.
- Connect the speed reference.

Steps 1 to 4 must be performed with the power off.

■ 5 Power up without run command.

■ 6 Mount the drive (page 73).

- Speed variation range
- Motor thermal protection
- Motor frequency if not equal to 50 Hz
- Motor voltage if not the same as that of the drive
- If the motor's power rating is not the same as that of the drive, please consult the CD-ROM supplied with the drive.

Tip:

- Perform an auto-tuning operation to optimize performance.

■ 7 Start.

Note: Check that the wiring of the drive is compatible with its configuration.

ENGLISH

Preliminary recommendations

Handling and storage

To protect the drive prior to installation, handle and store the device in its packaging. Ensure that the ambient conditions are acceptable.

⚠ WARNING

DAMAGED PACKAGING

If the packaging appears damaged, it can be dangerous to open and handle it.
Take precautions against all risks when performing this operation.

Failure to follow this instruction can result in death, serious physical injury or equipment damage.

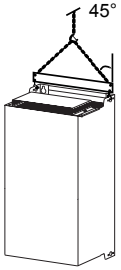
⚠ WARNING

DAMAGED EQUIPMENT

Do not operate or install any drive that appears damaged.

Failure to follow this instruction can result in death, serious physical injury or equipment damage.

Handling on installation



ALTIVAR 21 drives up to ratings ATV21WU75N4 and ATV21WU75N4C can be removed from their packaging and installed without a handling device.

A hoist must be used for higher ratings; for this reason they are fitted with handling "lugs". The precautions described below must be observed.

Recommendations

⚠ CAUTION

INCOMPATIBLE LINE VOLTAGE

Before turning on and configuring the drive, ensure that the line voltage is compatible with the supply voltage range shown on the nameplate. Before powering up and configuring the drive, ensure that the line voltage is compatible with the supply voltage range shown on the drive nameplate. The drive may be damaged if the line voltage is not compatible.

Failure to follow this instruction can result in physical injury and/or equipment damage.

⚠ DANGER

UNINTENDED EQUIPMENT OPERATION

Before turning on the drive or on exiting the configuration menus, check that the inputs assigned to the run command are deactivated (at state 0) since they can cause the motor to start immediately.

Failure to follow these instructions will result in death, serious physical injury or equipment damage.

Drive references

Three-phase supply voltage: 380…480 V 50/60 Hz

Drives with an integrated class A EMC filter

Motor		Line				Altivar 21		
Power indicated on plate *(1)*		Line current *(2)*		Apparent power	Maximum prospective line Isc	Max. continuous rated current *(1)*	Max. transient current for 60 s	Reference
		380 V	480 V	380 V		380 V/460 V		
kW	HP	A	A	kVA	kA	A	A	
0.75	1	1.7	1.4	1.6	5	2.2	2.4	ATV 21W075N4
1.5	2	3.2	2.5	2.8	5	3.7	4	ATV 21WU15N4
2.2	3	4.6	3.6	3.9	5	5.1	5.6	ATV 21WU22N4
3	–	6.2	4.9	5.5	5	7.2	7.9	ATV 21WU30N4
4	5	8.1	6.4	6.9	5	9.1	10	ATV 21WU40N4
5.5	7.5	10.9	8.6	9.1	22	12	13.2	ATV 21WU55N4
7.5	10	14.7	11.7	12.2	22	16	17.6	ATV 21WU75N4
11	15	21.2	16.9	17.1	22	22.5	24.8	ATV 21WD11N4
15	20	28.4	22.6	23.2	22	30.5	33.6	ATV 21WD15N4
18.5	25	34.9	27.8	28.2	22	37	40.7	ATV 21WD18N4
22	30	41.6	33.1	33.3	22	43.5	47.9	ATV 21WD22N4
30	40	56.7	44.7	44.6	22	58.5	64.4	ATV 21WD30N4
37	50	68.9	54.4	52	22	79	86.9	ATV 21WD37N4
45	60	83.8	65.9	61.9	22	94	103.4	ATV 21WD45N4
55	75	102.7	89	76.3	22	116	127.6	ATV 21WD55N4
75	100	141.8	111.3	105.3	22	160	176	ATV 21WD75N4

(1) These values are given for a rated switching frequency of 12 kHz up to ATV 21WD15N4 or 8 kHz for ATV 21WD18N4 to D75N4, used in continuous operation.
The switching frequency is adjustable from 6 to 16 kHz for all ratings. Above 8 or 12 kHz, depending on the rating, the drive will reduce the switching frequency automatically in the event of excessive temperature rise. For continuous operation above the rated switching frequency, derate the rated drive current (see our catalog).
(2) Typical value for the indicated motor power and for the maximum prospective line Isc.

Drive references

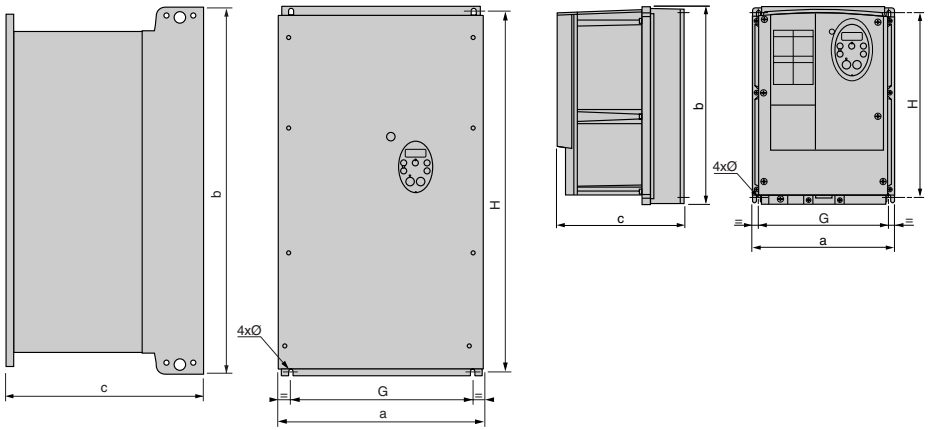
Three-phase supply voltage: 380…480 V 50/60 Hz

Drives with an integrated class B EMC filter

Motor		Line				Altivar 21		
Power indicated on plate *(1)*		Line current *(2)*		Apparent power	Maximum prospective line Isc	Max. continuous rated current *(1)*	Max. transient current for 60 s	Reference
		380 V	480 V	380 V		380 V/460 V		
kW	HP	A	A	kVA	kA	A	A	
0.75	1	1.7	1.4	1.6	5	2.2	2.4	ATV 21W075N4C
1.5	2	3.2	2.6	2.8	5	3.7	4	ATV 21WU15N4C
2.2	3	4.6	3.7	3.9	5	5.1	5.6	ATV 21WU22N4C
3	–	6.2	5	5.5	5	7.2	7.9	ATV 21WU30N4C
4	5	8.2	6.5	6.9	5	9.1	10	ATV 21WU40N4C
5.5	7.5	11	8.7	9.1	22	12	13.2	ATV 21WU55N4C
7.5	10	14.7	11.7	12.2	22	16	17.6	ATV 21WU75N4C
11	15	21.1	16.7	17.1	22	22.5	24.8	ATV 21WD11N4C
15	20	28.4	22.8	23.2	22	30.5	33.6	ATV 21WD15N4C
18.5	25	34.5	27.6	28.2	22	37	40.7	ATV 21WD18N4C
22	30	41.1	33.1	33.2	22	43.5	47.9	ATV 21WD22N4C
30	40	58.2	44.4	44.6	22	58.5	64.4	ATV 21WD30N4C
37	50	68.9	54.4	52	22	79	86.9	ATV 21WD37N4C
45	60	83.8	65.9	61.9	22	94	103.4	ATV 21WD45N4C
55	75	102.7	89	76.3	22	116	127.6	ATV 21WD55N4C
75	100	141.8	111.3	105.3	22	160	176	ATV 21WD75N4C

(1) These values are given for a rated switching frequency of 12 kHz up to ATV 21WD15N4C or 8 kHz for ATV 21WD18N4C to D75N4C, used in continuous operation.
The switching frequency is adjustable from 6 to 16 kHz for all ratings. Above 8 or 12 kHz, depending on the rating, the drive will reduce the switching frequency automatically in the event of excessive temperature rise. For continuous operation above the rated switching frequency, derate the rated drive current (see our catalog).
(2) Typical value for the indicated motor power and for the maximum prospective line Isc.

Dimensions



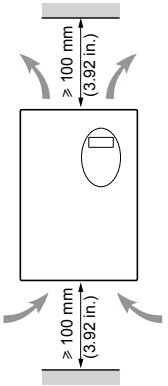
ATV 21W	a mm (in.)	b mm (in.)	c mm (in.)	G mm (in.)	H mm (in.)	Ø mm (in.)	Weight class A kg (lb.)	Weight class B kg (lb.)
075N4, U15N4, 075N4C, U15N4C	215 (8.46)	297 (11.69)	192 (7.56)	197 (7.75)	277 (10.90)	5.5 (0.22)	7 (15.43)	7.5 (16.53)
U22N4, U22N4C	230 (9.05)	340 (13.38)	208 (8.19)	212 (8.35)	318 (12.52)	5.5 (0.22)	7 (15.43)	7.5 (16.53)
U30N4 ... U55N4, U30N4C ... U55N4C	230 (9.05)	340 (13.38)	208 (8.19)	212 (8.35)	318 (12.52)	5.5 (0.22)	9.65 (21.26)	10.55 (23.25)
U75N4, U75N4C	230 (9.05)	340 (13.38)	208 (8.19)	212 (8.35)	318 (12.52)	5.5 (0.22)	10.95 (24.13)	11.85 (26.12)
D11N4, D15N4, D11N4C, D15N4C	290 (11.41)	560 (22.05)	315 (12.40)	250 (9.84)	544 (21.42)	6 (0.24)	30.3 (66.78)	36.5 (80.45)
D18N4, D18N4C	310 (12.20)	665 (26.18)	315 (12.40)	270 (10.62)	650 (25.59)	6 (0.24)	37.4 (82.43)	45 (99.18)
D22N4, D30N4, D22N4C, D30N4C	284 (11.18)	720 (28.35)	315 (12.40)	245 (9.64)	700 (27.56)	7 (0.27)	49.5 (109.10)	58.5 (128.93)
D37N4, D37N4C	284 (11.18)	880 (34.34)	343 (13.50)	245 (9.64)	860 (33.86)	7 (0.27)	57.4 (126.5)	77.4 (171)
D45N4, D45N4C	284 (11.18)	880 (34.34)	343 (13.50)	245 (9.64)	860 (33.86)	7 (0.27)	57.4 (126.5)	77.4 (171)
D55N4, D55N4C	362 (14.25)	1000 (39.37)	364 (14.33)	300 (11.81)	975 (38.39)	9 (0.35)	61.9 (136.5)	88.4 (195)
D75N4, D75N4C	362 (14.25)	1000 (39.37)	364 (14.33)	300 (11.81)	975 (38.39)	9 (0.35)	61.9 (136.5)	88.4 (195)

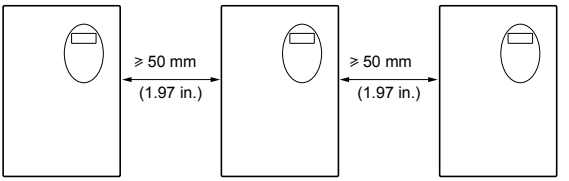
Installation

Installation recommendations

Depending on the conditions in which the drive is to be used, its installation will require certain precautions and the use of appropriate accessories.
Install the unit vertically:

- Do not place it close to heating elements.
- Leave sufficient free space to ensure that the air required for cooling purposes can circulate from the bottom to the top of the unit.



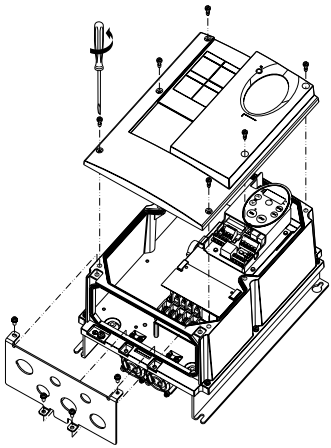


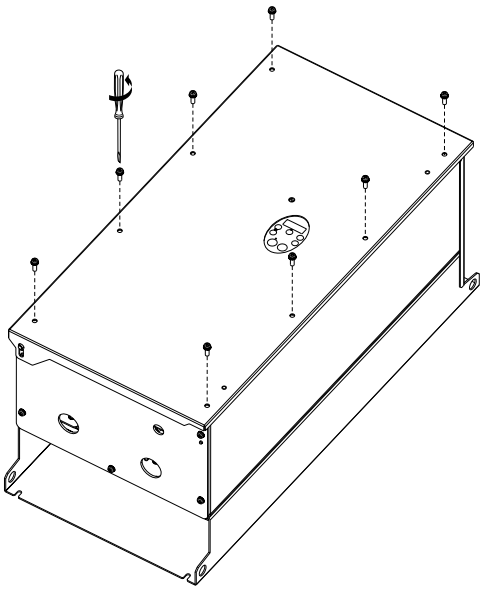
Operating temperature: 40°C max.

Derating curves based on an ambient temperature > 40°C and switching frequency: See our catalog.

Opening the drive

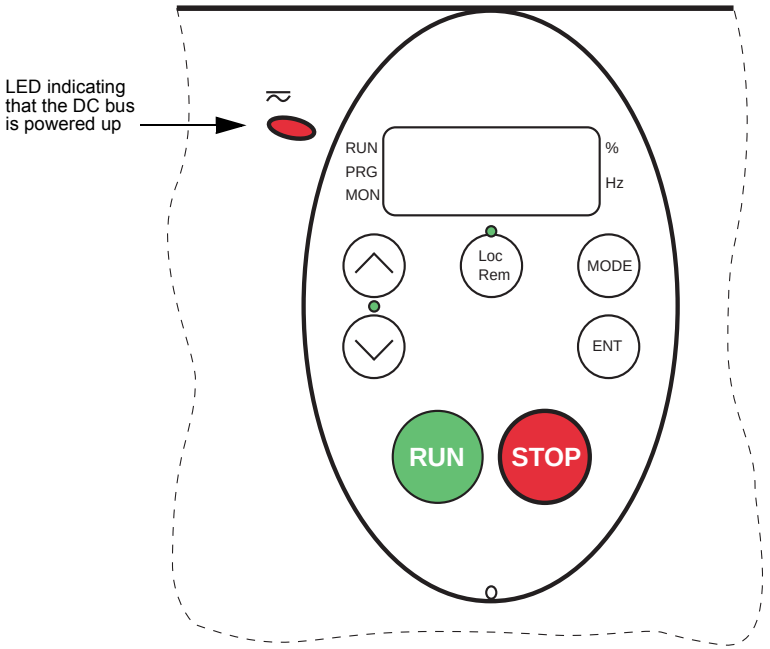
To open the drive, remove the front panel as shown in the two examples below.





Position of the capacitor charging LED

Before working on the drive, switch it off, wait until the capacitor charging LED has gone out, then measure the DC bus voltage.



Procedure for measuring the DC bus voltage

⚠ DANGER

HAZARDOUS VOLTAGE

Read and understand the instructions on page 42 before performing this procedure.

Failure to follow this instruction will result in death, serious physical injury or equipment damage.

The DC bus voltage can exceed 1000 V ⎓. Use a properly rated voltage sensing device when performing this procedure. To measure the DC bus voltage:

1 Disconnect the drive power supply.

2 WAIT 10 MINUTES to allow the DC bus capacitors to discharge.

3 Measure the voltage of the DC bus between the PA/+ and PC/- terminals to check whether the voltage is less than 45 V ⎓.

4 If the DC bus capacitors have not discharged completely, contact your local Schneider Electric representative (do not repair or operate the drive).

Wiring recommendations

Power

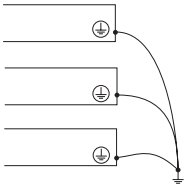
The drive must be connected to the protective ground. To comply with regulations in force concerning high leakage currents (above 3.5 mA), use at least a 10 mm² (AWG 6) protective conductor or 2 protective conductors with the same cross-section as the power section AC supply conductors.

⚠ DANGER

RISK OF HAZARDOUS VOLTAGE

Ground equipment using the provided ground connecting point as shown in the figure below. The drive panel must be properly grounded before power is applied.

Failure to follow these instructions will result in death, serious physical injury or equipment damage.



Check whether the resistance to the protective ground is one ohm or less.
Connect a number of variable speed drives to the protective ground, as shown opposite.
Do not lay protective grounding cables in a loop or in series.

⚠ WARNING

IMPROPER WIRING PRACTICES

- The ATV21 drive will be damaged if input line voltage is applied to the output terminals (U/T1,V/T2,W/T3).
- Check the power connections before powering up the ATV21 drive.
- If replacing another drive, verify that all wiring connections to the ATV21 drive comply with all wiring instructions in this manual.

Failure to follow this instruction can result in death, serious physical injury or equipment damage.

When upstream protection by means of a "residual current device" is required by the installation standards, a type A device should be used for single phase drives and type B for 3-phase drives. Choose a suitable model integrating:
- HF current filtering
- A time delay to prevent tripping caused by the load from stray capacitance on power-up. The time delay is not possible for 30 mA devices. In this case, choose devices with immunity against nuisance tripping, for example "residual current devices" with reinforced immunity from the **s.i** range (Merlin Gerin brand).

If the installation includes several drives, provide one "residual current device" per drive.

⚠ WARNING

RISK OF INAPPROPRIATE OVERCURRENTS

- Overcurrent protective devices must be properly coordinated.
- The Canadian Electricity Code and the National Electrical Code require branch circuit protection. Use the fuses recommended on the drive nameplate to achieve published short-circuit current ratings.
- Do not connect the drive to a power feeder whose short-circuit capacity exceeds the drive short-circuit current rating listed on the drive nameplate.

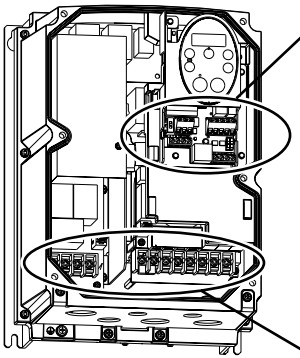
Failure to follow this instruction can result in death, serious physical injury or equipment damage.

Power terminals

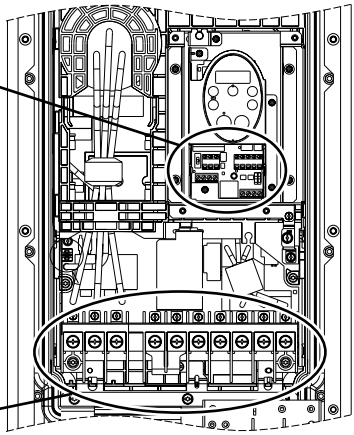
Access to terminals

The diagrams below illustrate the location of the terminals on the drive:

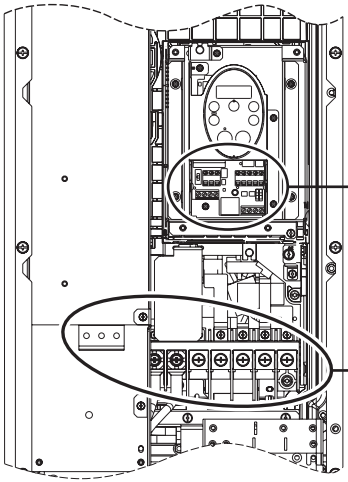
Example ATV21WU55N4C



Example ATV21WD15N4



Example ATV21WD18N4C



Functions of power terminals

Terminals	Function
⏚	Protective ground connection terminal
R/L1 - S/L2 - T/L3	Power section line supply
U/T1 - V/T2 - W/T3	Outputs to the motor
PO	Do not use
PA/+	DC bus + polarity
PB	Do not use
PC/-	DC bus - polarity

☞ The PO, PA/+, PB, and PC/- terminals can only be used to measure the DC bus voltage.

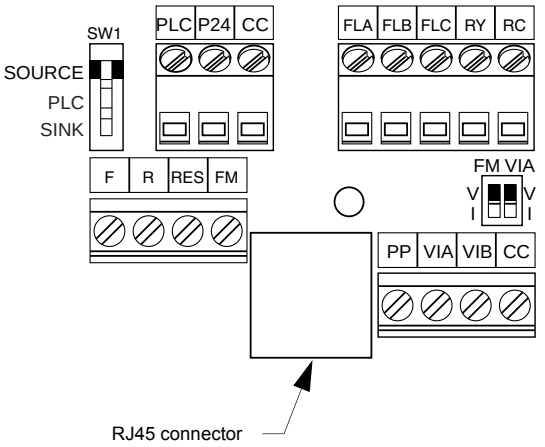
Power terminals

Characteristics of power terminals

ATV21W	Terminals R/L1 - S/L2 - T/L3				Other terminals			
	Maximum wire size			Tightening torque	Maximum wire size			Tightening torque
	mm²	AWG	kcmils	Nm (lb.in)	mm²	AWG	kcmils	Nm (lb.in)
075N4 ... U55N4, 075N4C ... U55N4C	6	10		1.3 (11.5)	6	10		1.3 (11.5)
U75N4, U75N4C	16	6		2.5 (22)	16	6		2.5 (22)
D11N4, D15N4	16	4		3 (26.5)	16	4		3 (26.5)
D11N4C, D15N4C	10	6		1.7 (15)	16	4		3 (26.5)
D18N4	25	3		5.4 (48)	25	3		5.4 (48)
D18N4C	16	4		2.2 (19.5)	25	3		5.4 (48)
D22N4, D30N4	50	1/0		24 (212)	50	1/0		24 (212)
D22N4C, D30N4C	25	3		4.3 (38)	50	1/0		24 (212)
D37N4, D45N4	50	1/0		24 (212)	50	1/0		24 (212)
D37N4C, D45N4C	50	1/0		7 (62)	50	1/0		24 (212)
D55N4, D75N4	150		300	41 (360)	150		300	41 (360)
D55N4C, D75N4C	130		250	16 (142)	150		300	41 (360)

Control terminals

The control card is the same for all ratings.



Switch factory settings:

SW1: SOURCE side (positive)
FM: V side
VIA: V side

Maximum wire size: 2.5 mm²/AWG 14
Tightening torque: 0.6 Nm (5.3 lb.in)

⚠ WARNING

RISK OF IMPROPER DRIVE OPERATION
The logic input type selector switch is set to the source position on delivery. Please consult the ATV21 Drive User's Manual (on the CD-ROM supplied with the drive) before changing the position of the switch.
Failure to follow these instructions can result in death or serious injury.

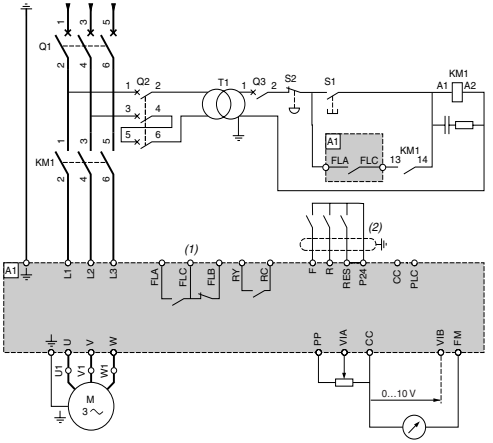
Control terminals

Electrical characteristics

Terminals	Function	Characteristics
PLC	External power supply input	+24 V input for external power supply to logic inputs (if there is one). Max. permissible 50 V
P24	Internal supply available	Short-circuit and overload protection: • 1 x 24 V ⎓ supply (min. 21 V, max. 27 V), maximum current 50 mA.
DC	Common	0 V common (2 terminals)
FLA, FLB, FLC	Configurable relay outputs	1 relay logic output, one "N/C" contact and one "N/O" contact with common point Minimum switching capacity: 3 mA for 24 V ⎓ Maximum switching capacity: • on resistive load (cos φ = 1): 1 A for 250 V ∿ or 30 V ⎓ on inductive load (cos φ = 0.4 and L/R = 7 ms): 0.5 A for 250 V ∿ or 30 V ⎓ Max. response time: 7 ms ± 0.5 ms Electrical service life: 100,000 operations
RY, RC		1 relay logic output, one "N/O" contact Minimum switching capacity: 3 mA for 24 V ⎓ Maximum switching capacity: • on resistive load (cos φ = 1): 1 A for 250 V ∿ or 30 V ⎓ • on inductive load (cos φ = 0.4 and L/R = 7 ms): 0.5 A for 250 V ∿ or 30 V ⎓ Max. response time: 7 ms ± 0.5 ms Electrical service life: 100,000 operations
F R RES	Logic inputs	3 programmable logic inputs, 24 V ⎓, compatible with level 1 PLC, IEC 65A-68 standard Impedance: 3.5 kΩ Maximum voltage: 30 V Max. sampling time: 2 ms ± 0.5 ms Multiple assignment makes it possible to configure several functions on one input
		Positive logic (Source): State 0 if ⩽ 5 V or logic input not wired, state 1 if ⩾ 11 V
		Negative logic (Sink): State 0 if ⩾ 16 V or logic input not wired, state 1 if ⩽ 10 V
FM	Analog output	1 switch-configurable voltage or current analog output: • Voltage analog output 0...10 V ⎓, minimum load impedance 470 Ω • Current analog output X-Y mA by programming X and Y from 0 to 20 mA, maximum load impedance 500 Ω Max. sampling time: 2 ms ± 0.5 ms Resolution: 10 bits Accuracy: ± 1% for a temperature variation of 60°C Linearity: ± 0.2%
PP	Internal supply available	Short-circuit and overload protection: • 1 x 10.5 V ⎓ ± 5% supply for the reference potentiometer (1 to 10 kΩ), maximum current 10 mA
VIA	Analog inputs	Switch-configurable current or voltage analog input: • Voltage analog input 0...10 V ⎓, impedance 30 kΩ (max. safe voltage 24 V) • Current analog input X-Y mA by programming X and Y from 0 to 20 mA, with impedance 242 Ω Max. sampling time: 2 ms ± 0.5 ms Resolution: 11 bits Accuracy: ± 0,6% for a temperature variation of 60°C Linearity: ± 0,15% of the maximum value This analog input can also be configured as a logic input, see the CD-ROM supplied with the drive.
VIB		Voltage analog input, configurable as an analog input or as a PTC probe input. Voltage analog input: • 0...10 V ⎓, impedance 30 kΩ (max. safe voltage 24 V) • Max. sampling time: 2 ms ± 0.5 ms • Resolution: 11 bits • Accuracy: ± 0,6% for a temperature variation of 60°C • Linearity: ± 0,15% of the maximum value PTC probe input: • 6 probes max. mounted in series • Rated value < 1.5 kΩ • Trip resistance 3 kΩ, reset value 1.8 kΩ • Short-circuit protection < 50 Ω

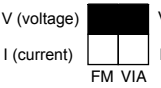
Connection diagrams

3-phase power supply

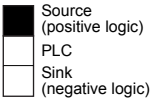


Switches (factory settings)

Voltage/current selection for analog I/O (FM and VIA)



Selection of logic type



Note: All terminals are located at the bottom of the drive. Install interference suppressors on all inductive circuits near the drive or connected on the same circuit, such as relays, contactors, solenoid valves, fluorescent lighting, etc.

Components that can be used in association with the Altivar: See our catalog.

Terminal functions (factory settings)

FLA-FLB-FLC relay	De-energized in the event of a fault or if the power supply is disconnected
RY-RC relay	Energized when the speed is greater than or equal to low speed (LL)
F	Forward (2-wire control)
R	Preset speed
RES	Clear fault (reset)
VIA	Speed reference 0-10 V
VIB	Not assigned
FM	Output frequency

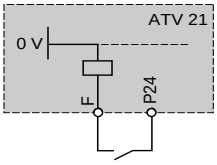
(1) Fault relay contacts, for remote signaling of drive status
(2) The logic input common connection assumes that the "Source - PLC - Sink" switch is set to the "Source" position (factory setting).

Connection diagrams

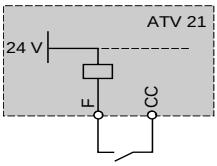
Examples of recommended circuit diagrams

Logic inputs according to the position of the logic type switch

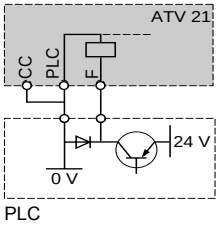
"Source" position



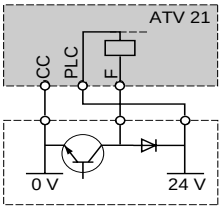
"Sink" position



"PLC" position with PLC transistor outputs

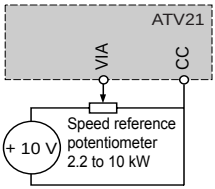


PLC



PLC

Voltage analog inputs
+ 10 V external



ENGLISH

Operation on an IT system

IT system: Isolated or impedance grounded neutral.
Use a permanent insulation monitor compatible with non-linear loads, for example, a Merlin Gerin type XM200 or equivalent.

Altivar 21W drives feature integrated RFI filters. These filters must be isolated from ground for operation on an IT system as follows:

ATV21W●●●N4 with integrated class A EMC filter

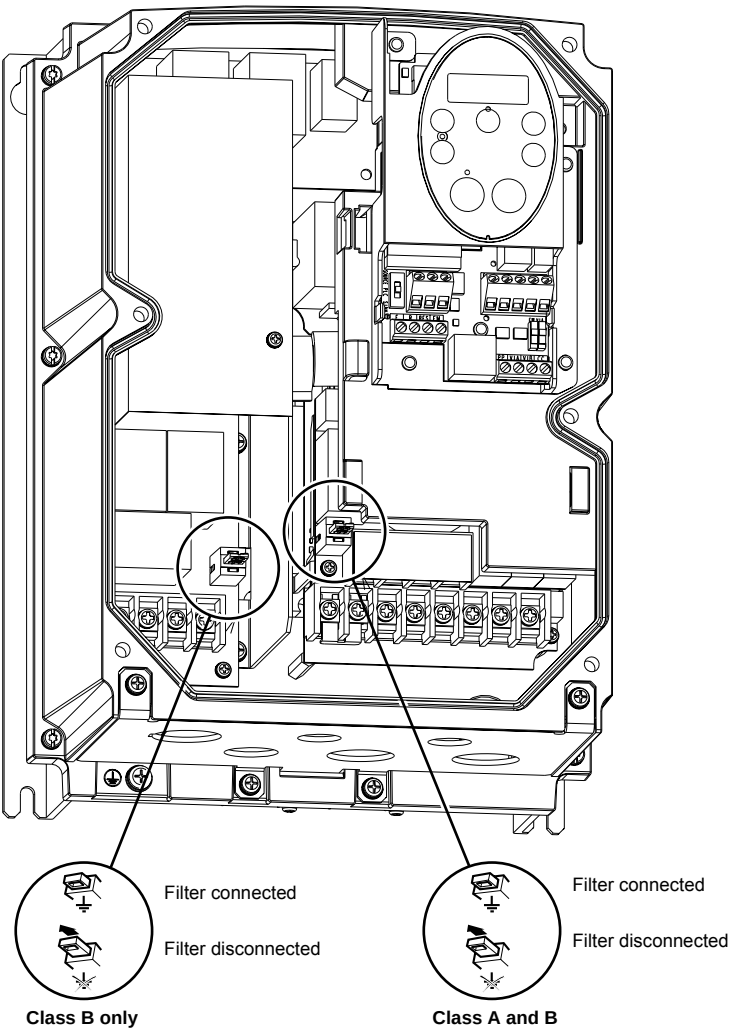
One or two jumpers must be activated to disconnect the filters.

ATV21W●●●N4C with integrated class B EMC filter

These drives must not be used on an IT system. The jumpers and disconnects for the filters are reserved for Schneider Electric product support.

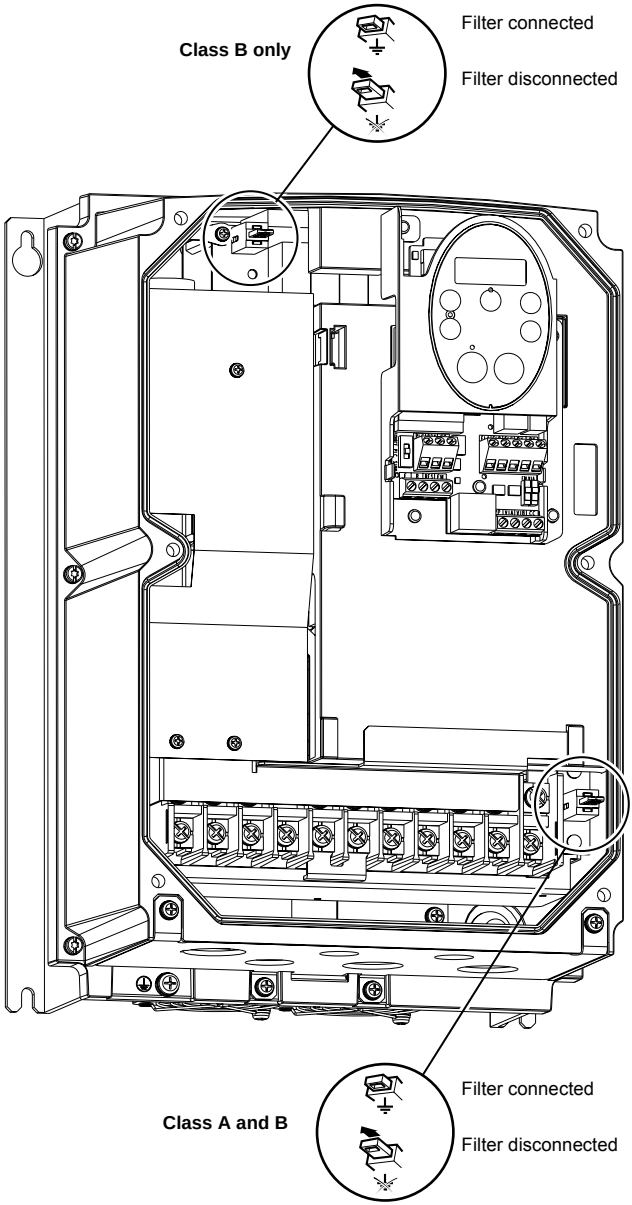
Layout of jumpers and disconnects for filters

ATV21W075N4 to U55N4 (class A)
ATV21W075N4C to U55N4C (class B)



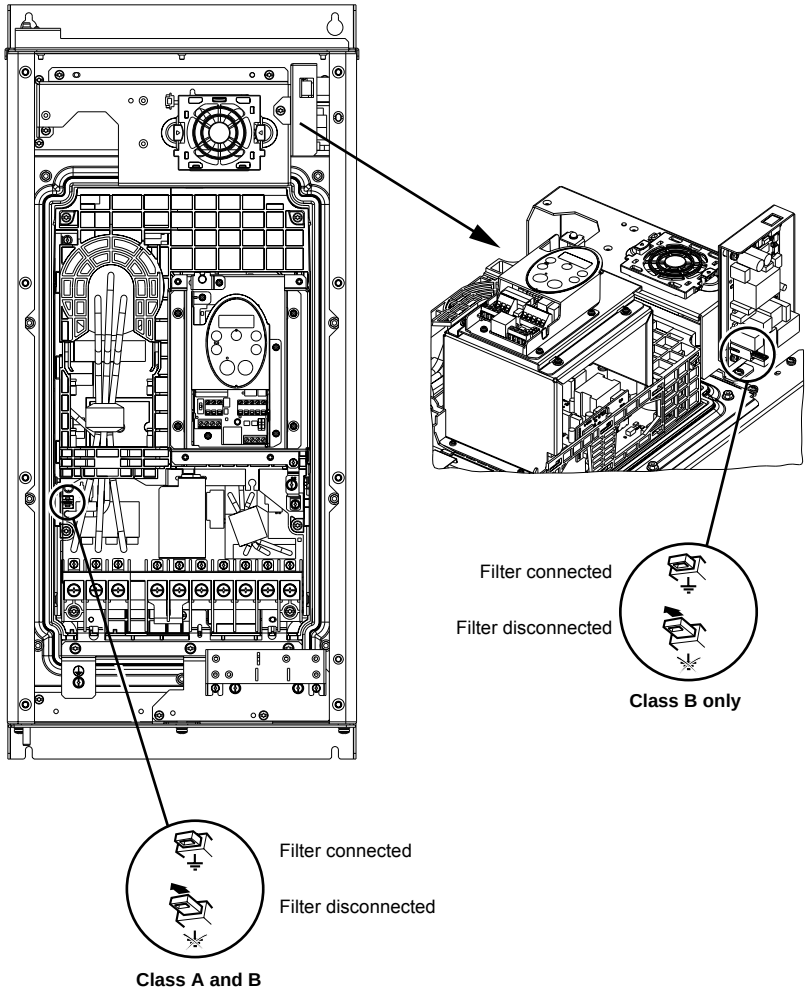
Layout of jumpers and disconnects for filters

ATV21WU75N4 (class A)
ATV21WU75N4C (class B)



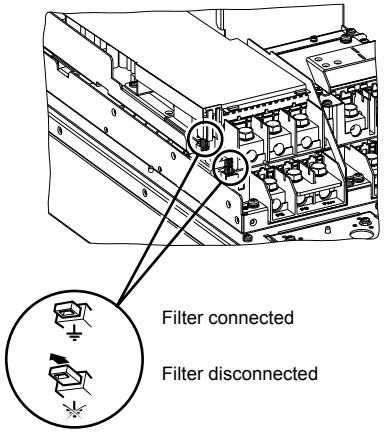
Layout of jumpers and disconnects for filters

ATV21WD11N4 to D18N4 (class A)
ATV21WD11N4C to D18N4C (class B)

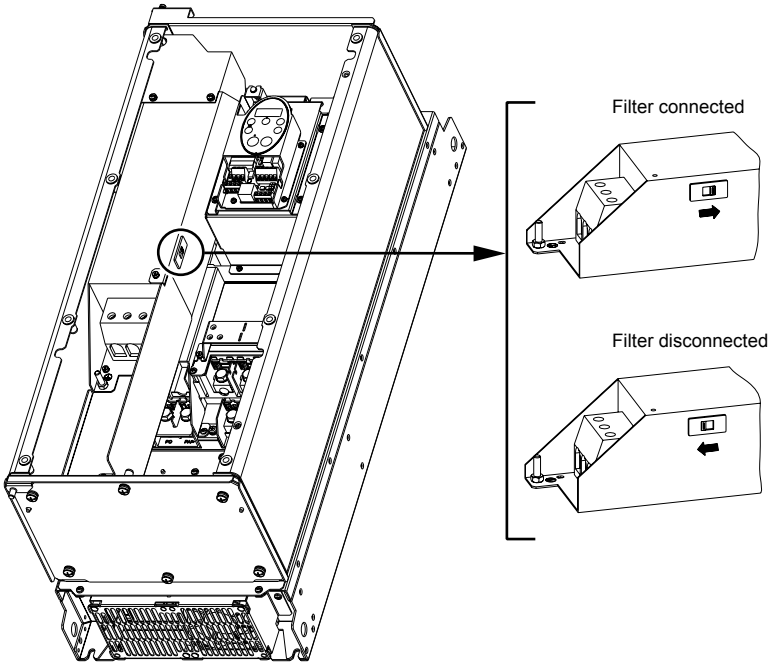


Layout of jumpers and disconnects for filters

ATV21WD22N4 to D75N4 (class A)



ATV21WD22N4C to D75N4C (class B)



Electromagnetic compatibility, wiring

Principle and precautions

- Grounds between drive, motor and cable shielding must have "high-frequency" equipotentiality.
- Use of shielded cables with shielding connected to ground at both ends for the motor cables, braking resistor (if used) and control-signaling wiring. Metal ducting or conduit can be used for part of the shielding length provided that there is no break in continuity.
- Keep the control circuits away from the power circuits. For control and speed reference circuits, we recommend using shielded twisted cables with a pitch of between 25 and 50 mm (0.98 and 1.97 in.)
- Ensure maximum separation between the power supply cable (line supply) and the motor cable.
- The motor cables must be at least 0.5 m (20 in.) long.
- Do not use surge arresters or power factor correction capacitors on the variable speed drive output.
- The HF equipotential ground connection between the drive, motor and cable shielding does not remove the need to connect the PE protective conductors (green-yellow) to the appropriate terminals on each unit.

⚠ DANGER

HAZARDOUS VOLTAGE

- The cable shielding should only be stripped where connected to ground (in the metal cable glands and underneath the grounding clamps).
- Make sure that there is no risk of the shielding coming into contact with live components.

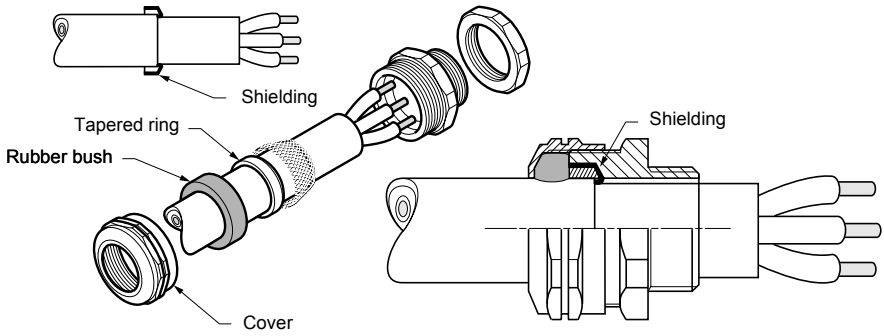
Failure to follow these instructions will result in death, serious physical injury or equipment damage.

Connection plates:

There are connection plates on the lower sections of the variable speed drives. These plates are drilled in order to allow cables to be routed through them via cable glands. Cable glands must be ordered separately; **they are not supplied with the variable speed drive**.

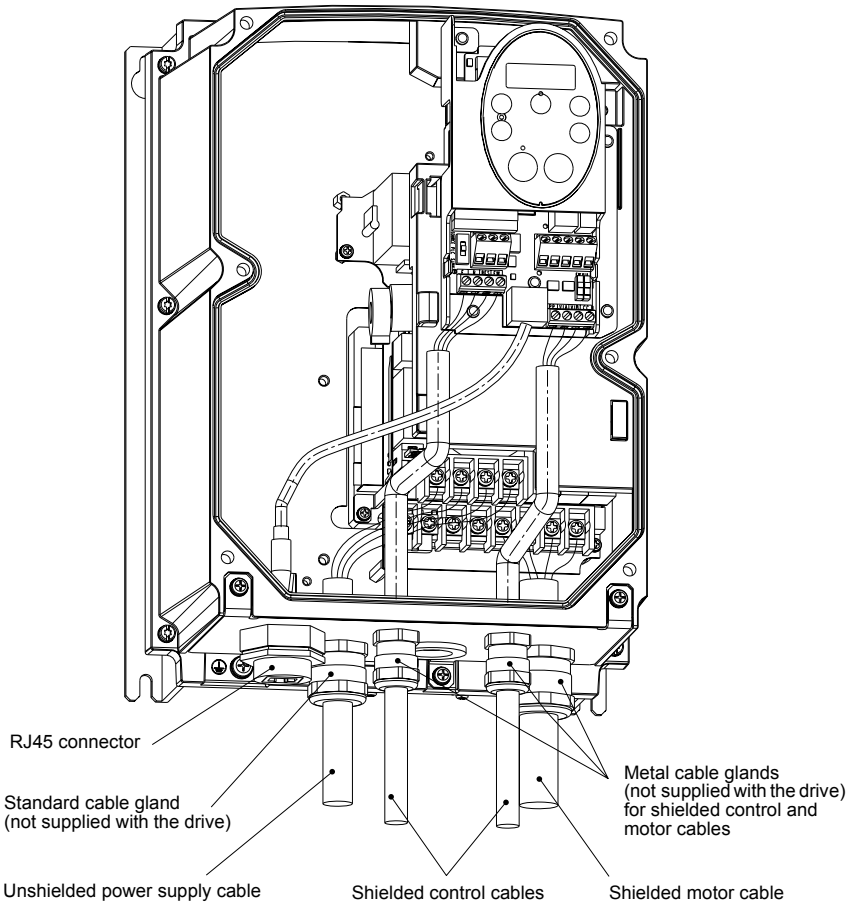
Mounting and connecting a shielded motor cable with metal cable gland (not supplied with the drive):

- Prepare the shielded cable by stripping both ends ready for connection.
- Loosen the cover of the cable gland.
- Attach the shielded cable to the cable gland ensuring it is fully in contact (throughout 360°).
- Fold back the shielding and clamp it between the ring and the body of the cable gland, and tighten the cover.



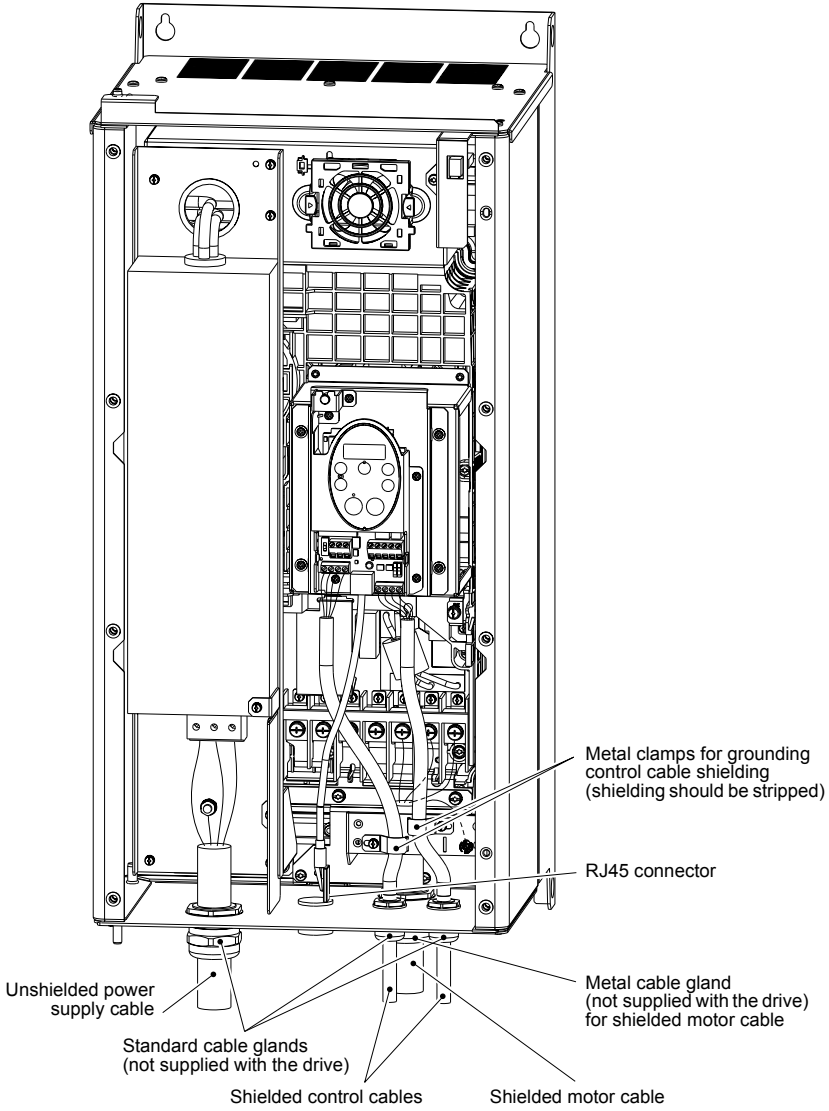
Electromagnetic compatibility, wiring

Example of wiring: ATV21W075N4C to U55N4C



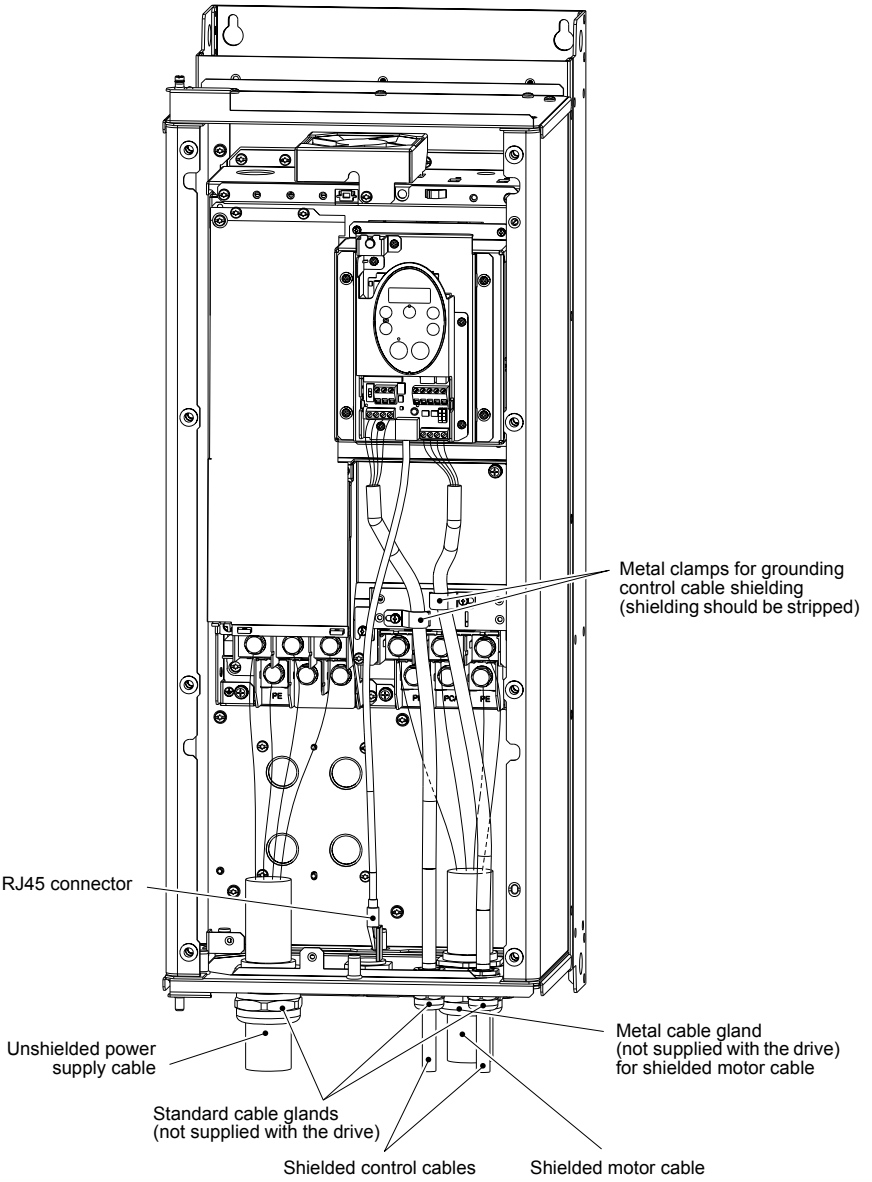
Electromagnetic compatibility, wiring

Example of wiring: ATV21WD11N4C to D18N4C



Electromagnetic compatibility, wiring

Example of wiring: ATV21WD22N4C to D75N4C



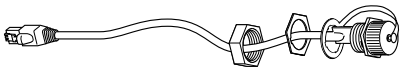
Electromagnetic compatibility, wiring

Using the RJ45 socket

For example, ATV21W075N4 to U75N4

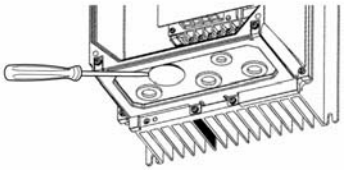
Using the dust and damp proof (IP55) RJ45 cable VW3A01500 and cable VW3A01501

VW3A01500

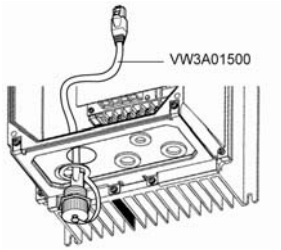


VW3A01501

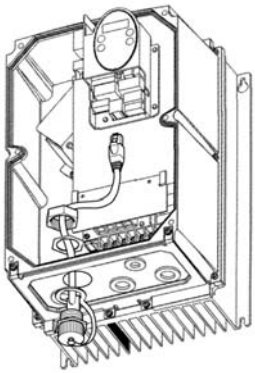
1)



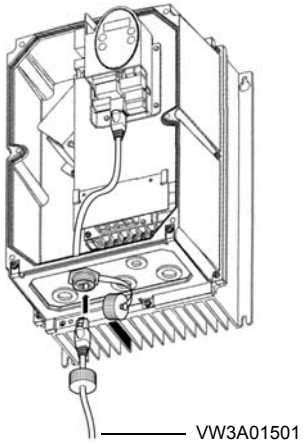
2)



3)



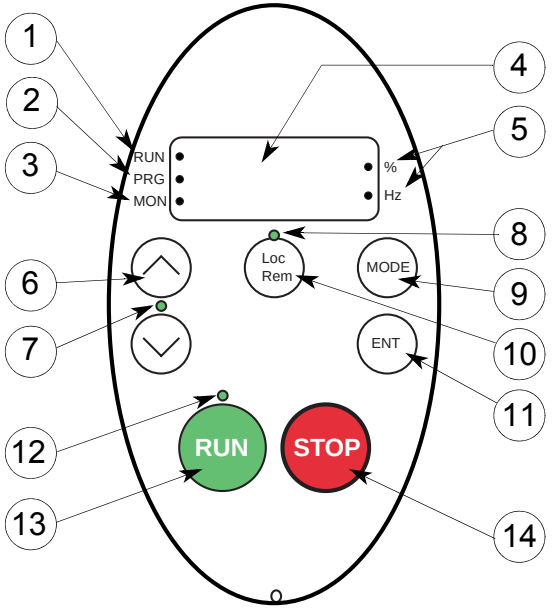
4)



Integrated display terminal

Description of integrated display terminal

The following diagram shows the LEDs and keys on the integrated display terminal:

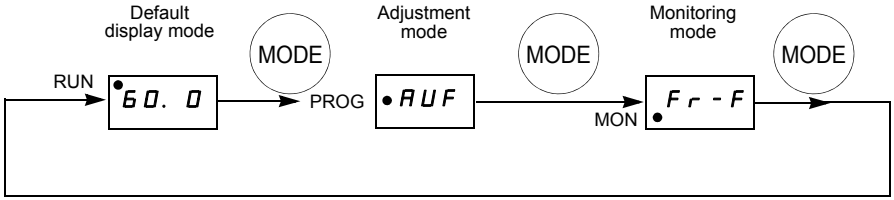


	LED/Key	Characteristics
1	Display terminal RUN LED	Lights up when the run command is active Flashes to indicate a speed reference
2	Display terminal PRG LED	Lights up in programming mode (AUF... GrU)
3	Display terminal MON LED	Lights up in monitoring mode
4	Display terminal	4 digits, 7 segments
5	Display terminal unit LED	Numerical value displayed in hertz or per cent
6	Navigation arrows	Depending on the mode: Navigate in menus Change a value Change the speed reference when the LED is lit (10)
7	Arrow LED	Lights up when the arrows are affecting the speed reference
8	Loc/Rem LED	Command and reference switching between terminals/com ↔ display terminal
9	Mode	Mode selection: • Default display mode • Adjustment mode • Monitoring mode Can also be used to go back to the previous menu
10	Loc/Rem key	Command and reference switching between terminals/com ↔ display terminal
11	ENT	Confirmation of entries
12	RUN LED	Lights up when the ATV is in local run command mode
13	RUN	Local run command
14	STOP	Stop/Reset in the event of a fault

Programming

Accessing the various modes

Using the "MODE" key

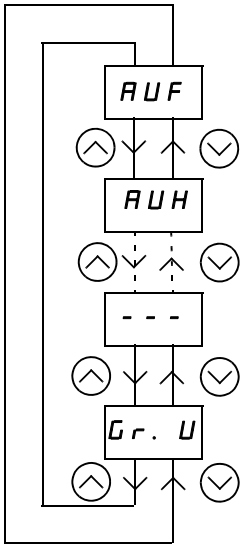


Default display mode	• Active on power-up. • Permanent display of a drive variable, current, speed, etc., as well as alarms and faults.
Adjustment mode	• Can be used to modify all drive parameters.
Monitoring mode	• Can be used to control frequency settings, output current or voltage and information from the terminals.

Note: For more detailed information, please consult the CD-ROM supplied with the drive.

Access to menus

Example in adjustment mode:

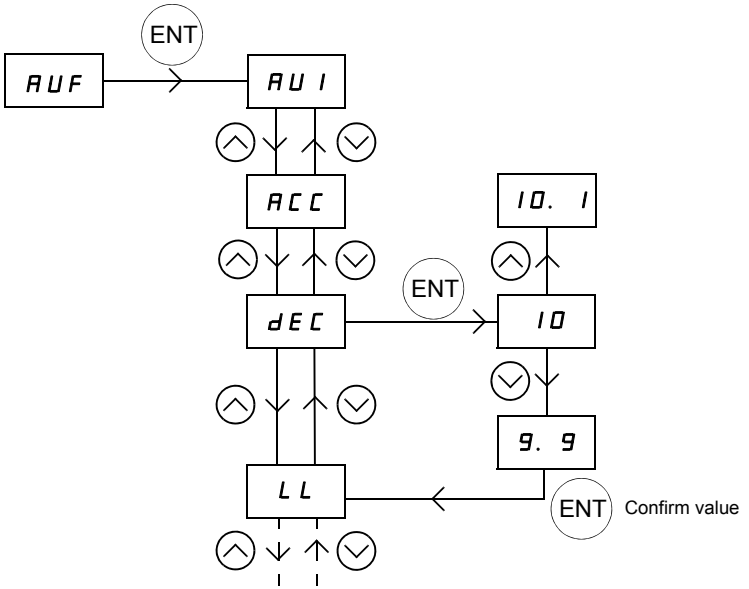


Note: Press the "MODE" key to go back up to the next level; here, for example: Go back to Fr-F.

Programming

Access to parameters

Example: Quick menu



Note: Press the "MODE" key to go to the previous level.
Examples:

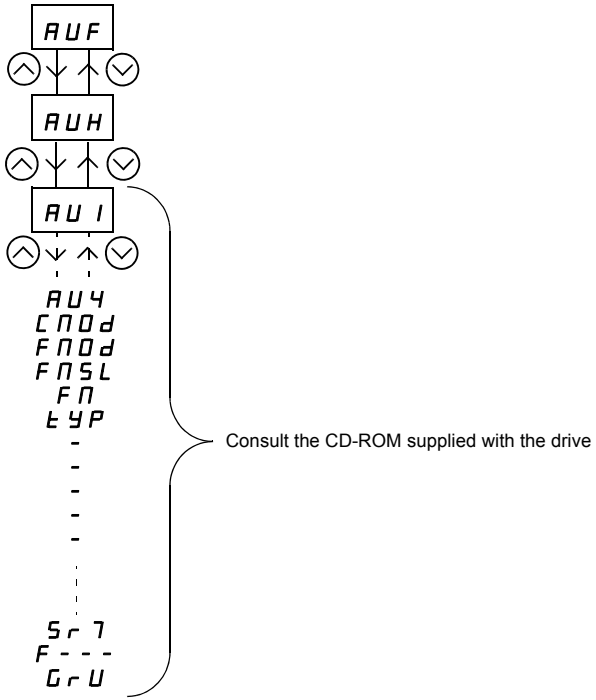
- 9.9 to dEC
- dEC to AUF

Adjustment mode

Description of menus

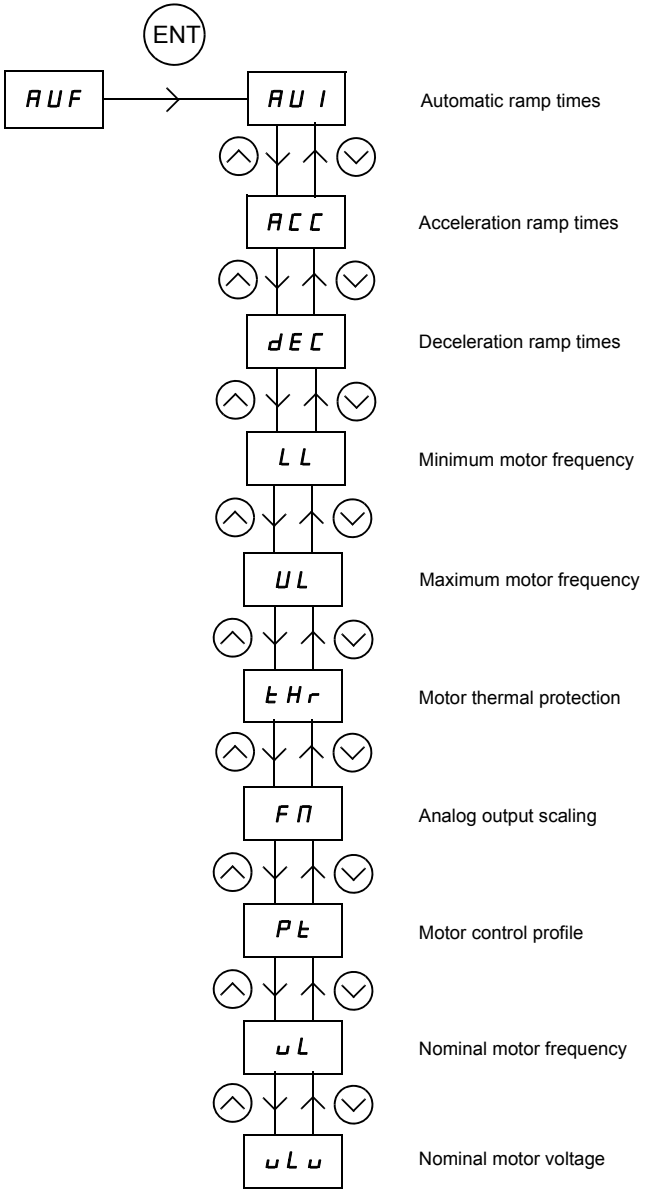
The following diagram shows the various menus that can be accessed from the quick menu AUF:

AUF menu: Fast startup menu providing access to current application parameters and sufficient in the majority of cases.
AUH menu: This menu provides access to the last 5 parameters modified in reverse chronological order (the last parameter modified appears first).



Adjustment mode

The following diagram shows the various parameters that can be accessed from the quick menu AUF.



Adjustment mode

AUF menu

The following diagram shows the various parameters that can be accessed from the AUF menu.

Code	Description	Adjustment ranges	Factory settings
AUt	Automatic ramp times.	0 : Deactivated 1 : Automatic acceleration and deceleration times 2 : Automatic acceleration time only	1
ACC	Acceleration time in seconds	0.0 to 3200	10.0
dEC	Deceleration time in seconds	0.0 to 3200	10.0
LL	Lower frequency limit (minimum motor frequency) in Hz.	0.0 to UL	0.0
UL	Upper frequency limit (maximum motor frequency) in Hz	0.5 to 200.0	50.0
tHr	Level of motor electronic thermal protection as a % of the rated output current indicated on the drive nameplate	10 to 100	100
FM	Measurement adjustment (analog output scaling). Consult the CD-ROM supplied with the drive.	-	-
Pt	Selection of V/F control mode (motor control profile)	0: Constant torque V/F 1: Variable torque V/F 2: Automatic torque "boost" 3: Flux vector control 4: Energy saving 6: Synchronous permanent magnet motor	1
uL	Base frequency (rated motor frequency) in Hz	25 to 200.0	50.0
uLu	Voltage at base frequency (rated motor voltage) in V	50 to 660	400

With the exception of ACC and dEC, the parameters cannot be modified with the drive running.

Monitoring mode

Display of information associated with faults

Display of fault code

If the drive trips, a fault code will be displayed indicating the cause. As trip records are logged, information about each trip can be displayed at any time in default display mode.

The following table lists the various fault codes and what they mean.

Fault code	Description
nErr	No fault
OC 1-OC 1P	Overcurrent during acceleration
OC2-OC2P	Overcurrent during deceleration
OC3-OC3P	Overcurrent during operation at constant speed
OCL	Motor overcurrent during startup
OCA	Drive overcurrent during startup
EPH1	Input phase fault or overexcitation of capacitor in main circuit
EPHO	Output phase fault
OP1	Overvoltage during acceleration
OP2	Overvoltage during deceleration
OP3	Overvoltage during operation at constant speed
OL1	Drive trip due to overload
OL2	Motor trip due to overload
OLr	Overload on dynamic braking
OH	Trip due to overheating or failure of thermal detector
E	Emergency stop
EEP1	EEPROM 1 failure (write error)
EEP2	Failure of EEPROM 2 (initialization or power-up error during parameterization of tYP)
EEP3	EEPROM 3 failure (read error)
Err2	Drive RAM failure
Err3	Drive ROM failure
Err4	CPU 1 fault
Err5	Communication fault
Err7	Current sensor fault
Err8	Line fault

Monitoring mode

Fault code	Description
UC	Low current fault
UP 1	Undervoltage fault
Ot	Overtorque fault
EF2	Grounding fault
Etn 1	Auto-tune fault
EtYP	Drive type error
OH2	External thermal input
E- 18	VIA cable break
E- 19	Communication fault between CPUs
E-20	V/F control fault
E-21	CPU 2 fault
SOUt	Synchronization fault (for permanent magnet motors only)

Note: Records of previous trips (records of trips logged or trips that occurred in the past) can be restored. The CD-ROM supplied with the drive contains information about advanced diagnostics.